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EXAMINER

RASHID, DAVID

| ART UNIT | PAPER NUMBER |
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2624

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08/13/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|-------------------------------|--------------------------------|--|
| Office Action Summary | Application No. 10/806,547 | Applicant(s) AOYAMA, CHIAKI | |
| | Examiner David P. Rashid | Art Unit 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2007.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
 4a) Of the above claim(s) 6, 8 - 9 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-5, 7, 10 and 11 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

All of the examiner's suggestions presented herein below have been assumed for examination purposes, unless otherwise noted.

Amendments

1. This office action is responsive to the claim and specification amendment received on 7/25/2007. **Claims 1 – 5, 7, and 10 – 11** remain pending.

Drawings

2. The replacement drawings were received on 7/25/2007 and are acceptable. In response to applicant's drawing amendments and remarks, the previous drawing objections are withdrawn.

Specification

3. In response to applicant's specification amendments and remarks received on 7/25/2007, the previous specification objections are withdrawn.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claim 7** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 7 recites "[a] computer program recorded on a computer-readable medium" and "[a] computer program" per se is non-statutory, as being an abstract idea.

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The element of “recorded on a computer-readable medium” may be where it is stored, but it is the program itself that is being claimed – and thus non-statutory. Suggest changing claim 7 to the following:

“A computer-readable medium comprising a computer program for a computer used for an apparatus ~~A computer program recorded on a computer-readable medium for a computer used for an apparatus,~~ which generates calibration information ... and the calibration information, when executed by a computer used for an apparatus, causes the computer to perform the process steps of: ~~the computer program being executed by the computer in a process comprising:~~

(a) incorporation...”

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 2 – 5, and 7** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The amended independent claims add the negative limitations “...without any mask restricting an incident beam of light...” and “...wherein the camera unit obtains the image without any mask restricting the incident beam of light....”.

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The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Note that a lack of literal basis in the specification for a negative limitation may not be sufficient to establish a prima facie case for lack of descriptive support. *Ex parte Parks*, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993).

MPEP 2173.05(i)

The camera unit obtaining an image without any mask restricting the incident beam of light lacks a “literal basis” within the original disclosure. The previous prior art rejections on record pertaining to the claims under 35 U.S.C. 112, first paragraph are kept as the examiner finds the subject matter added to the claims (2 – 5, and 7) new matter and will not be considered since the negative limitation lacks a definite literal basis within the original disclosure. Mere silence of a camera without any mask restricting an incident beam of light is not support.

It must also be noted that the original disclosure supports the camera unit as being a CCD camera. An inherent feature of all cameras is an “aperture” – an extremely important “opening element” through which light is admitted in controlling exposure in combination with shutter speed. CCD cameras, like all cameras, have apertures that are also known as “masks” – thus masks are an inherent feature of the disclosed camera in the examined application.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for

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patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Taniguchi (US 6,312,859 B1).

Regarding **claim 1**, Taniguchi discloses a method for measuring a position of an object (FIG. 1, elements W, 13, 14; Col. 4, lines 57 - 64) captured by a camera unit (a camera is a device used to capture images; the projection exposure apparatus of FIG. 1 is a camera unit in reference to Col. 10, line 58 – Col. 11, line 11.), the method comprising the steps of:

calculating a discrepancy (ΔL in FIG. 4A; also discrepancies with respect to element 7 in FIG. 4B, FIG. 4C, FIG. 4D) of an incident beam of light penetrating a lens systems (FIG. 1, elements 7, 10) of the camera unit relative to an optical center of the lens system (FIG. 4A, element delta L; Col. 11, lines 36 - 52); and

compensating the position of the object according to the discrepancy (FIG. 1, elements 13, 14; FIG. 4A, elements P2, 12; Col. 11, lines 36 - 52);

wherein a distance between the object and the camera unit is not known prior to measuring the position of the object (refer to paragraphs below).

Taniguchi makes no mention of knowing the distance between the object and projection exposure apparatus with respect to vertical distance, and thus the distance would not be known prior to measuring the position of the object.

With respect to horizontal distance, Taniguchi discloses that the base-line amount measuring device measures the base-line amount prior to exposure (Col. 11, lines 31 – 39), but it is also true that if it is measuring the base-line amount prior to exposure, then there exists time

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before the measurement where the distance was not known (which is thus also prior to measuring the position of the object).

10. **Claims 2, 3, 5, and 7** are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabata et al. (2002/0196422 A1).

Regarding **claim 2**, Tanabata discloses a method for measuring a position of an object (FIG. 1, paragraph [0028]) with a combination of an image of the object captured by a camera unit (FIG. 1, FIG. 10A, element 200) and calibration information (FIG. 9), the calibration information being prepared in advance in such a manner that a position of a measurement pixel of the image is correlated with a direction of an incident beam of light (FIG. 1, element 350; paragraph[0042], FIG. 9, FIG. 10) and a displacement from a reference point to the incident beam (FIG. 10, element d), the method comprising the steps of:

- (a) incorporating the image (FIG. 1, elements 310, 330);
- (b) detecting a position of a pixel representative of the object in the image incorporated at step (a) (FIG. 10B, elements 52a, 52b, d); and
- (c) calculating the position of the object according to the direction and the displacement of the incident beam (FIG. 1, element 350; paragraph [0041]), which are obtained from the calibration information with reference to the position of the pixel detected at step (b) (FIG. 9, paragraph [0042]).

Regarding **claim 3**, Tanabata discloses an apparatus for measuring a position of an object (FIG. 1, paragraph [0028]) according to an image of the object captured by a camera unit (FIG. 1, element 310; FIG. 10A, element 200), the apparatus comprising:

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an image input means (FIG. 1, elements 310, 330) for incorporating the image;

a pixel position detection means (FIG. 10B, elements 52a, 52b, d) for detecting a position of a pixel representative of the object in the image incorporated by the image input means;

a storage means (FIG. 1, element 350; paragraph [0042]) for storing calibration information which correlates the position of the pixel with both a direction of an incident beam of light originating from the object (FIG. 9, y-axis) and a displacement from a reference point to the incident beam (FIG. 9, x-axis); and

a position calculation means (FIG. 1, element 350) for calculating the position of the object according to the direction (FIG. 10A shows varying horizontal positions to the fixed camera 200) and the displacement of the incident beam (paragraph [0041]), which are derived from the calibration information with reference to the position of the pixel detected by the pixel position detection means (“interpolation calculation” in paragraph [0049]).

Regarding **claim 5**, Tanabata discloses the apparatus according to claim 3, wherein the pixel position detection means (FIG. 10B, elements 52a, 52b, d) detects the position of the pixel representative of the object (paragraph [0044]) have a marker (FIG. 10A, element 51; FIG. 10B, element 52) identifying a typical spot of the object.

Regarding **claim 7**, claim 2 recites identical features as in the computer program for a computer used for an apparatus of claim 7 (paragraph [0039]). Thus, references/arguments equivalent to those presented above for claim 2 is equally applicable to claim 7.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 10 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Taniguchi (US 6,312,859 B1) and Tanabata et al. (2002/0196422 A1).

Regarding **claim 10**, while the combination of Taniguchi in view of Tanabata disclose the method for measuring a position of an objecting according to claim 1, the combination does not teach wherein the discrepancy calculating step involves use of calibration information prepared in advance, wherein the method further involves generating the calibration information in the steps of:

projecting a beam of light on individual pixels of a camera image;

according to the beam of light incident on each pixel, calculating a displacement from a reference point to the incident beam of light; and

generating the calibration information by correlating a direction and the displacement of the incident beam of light with a position of each pixel.

Tanabata discloses a distance measuring method and image input device with distance measuring function (FIG. 1) that teaches wherein the discrepancy calculating step involves use of calibration information prepared in advance (FIG. 1, element 350; Col. 5, lines 56 - 60), wherein the method further involves generating the calibration information in the steps of:

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projecting a beam of light on individual pixels of a camera image (FIG. 1, elements 240, 241);

according to the beam of light incident on each pixel, calculating a displacement from a reference point to the incident beam of light (FIG. 10B, elements 52, d; Col. 6, lines 56 - 64); and

generating the calibration information by correlating a direction (FIG. 9, y-axis) and the displacement (FIG. 9, x-axis) of the incident beam of light with a position of each pixel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the combination of Taniguchi in view of Tanabata to include the discrepancy calculating step involving use of calibration information prepared in advance as taught by Tanabata so that "...a distance may be obtained by substituting the displacement into the calculation equation.", Tanabata, Col. 5, lines 60 - 62, wherein the method further involves generating the calibration information in the steps of:

projecting a beam of light on individual pixels of a camera image;

according to the beam of light incident on each pixel, calculating a displacement from a reference point to the incident beam of light; and

generating the calibration information by correlating a direction and the displacement of the incident beam of light with a position of each pixel as taught by Tanabata "...to provide a distance measuring technology capable of stably and accurately performing distance measurement of an object with out any highly accurate focus control mechanism...", Tanabata, Col. 2, lines 2 - 5.

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Regarding **claim 11**, while the combination of Taniguchi in view of Tanabata disclose the method for measuring a position of an object according to claim 1, the combination does not teach wherein the method further involves generating the calibration information in the steps of:

adjusting a first direction of the camera unit so that a first peak intensity of light emitted by a light source falls in a measurement pixel captured by the camera unit, and measuring a first relative position of the light source relative to the camera unit;

adjusting a second direction of the camera unit so that a second peak intensity of light emitted by the light source falls in the measurement pixel, and measuring a second relative position of the light source relative to the camera unit;

repeating determination of an incident beam of light impinging on the measuring pixel according to the first and second relative positions for predetermined measurement pixels;

calculating a displacement from a reference point to the incident beam of light for each of the measurement pixels; and

generating the calibration information which correlates a direction and the displacement of the incident beam of light with each of the measurement pixels.

Tanabata discloses a distance measuring method and image input device with distance measuring function (FIG. 1) that teaches wherein the method further involves generating the calibration information in the steps of:

adjusting a first direction of the camera unit so that a first peak intensity of light emitted by a light source falls in a measurement pixel captured by the camera unit, and measuring a first relative position of the light source relative to the camera unit (FIG. 10A, elements D, 50a, 51a; paragraph [0044]);

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adjusting a second direction of the camera unit so that a second peak intensity of light emitted by the light source falls in the measurement pixel, and measuring a second relative position of the light source relative to the camera unit (FIG. 10A, elements D1, 50b, 51b; paragraph [0044]);

repeating determination of an incident beam of light impinging on the measuring pixel according to the first and second relative positions for predetermined measurement pixels (paragraph [0045]; paragraph [0046]);

calculating a displacement from a reference point to the incident beam of light for each of the measurement pixels (FIG. 10B, element d); and

generating the calibration information which correlates a direction (FIG. 9, y-axis) and the displacement (FIG. 9, x-axis) of the incident beam of light with each of the measurement pixels (FIG. 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the combination of Taniguchi in view of Tanabata to include wherein the method further involves generating the calibration information in the steps of:

adjusting a first direction of the camera unit so that a first peak intensity of light emitted by a light source falls in a measurement pixel captured by the camera unit, and measuring a first relative position of the light source relative to the camera unit;

adjusting a second direction of the camera unit so that a second peak intensity of light emitted by the light source falls in the measurement pixel, and measuring a second relative position of the light source relative to the camera unit;

repeating determination of an incident beam of light impinging on the measuring pixel according to the first and second relative positions for predetermined measurement pixels;

calculating a displacement from a reference point to the incident beam of light for each of the measurement pixels; and

generating the calibration information which correlates a direction and the displacement of the incident beam of light with each of the measurement pixels as taught by Tanabata "...to provide a distance measuring technology capable of stably and accurately performing distance measurement of an object with out any highly accurate focus control mechanism...", Tanabata, Col. 2, lines 2 – 5.

13. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Tanabata et al. (2002/0196422 A1) and Day et al. (US 4,639,878 A).

Regarding **claim 4**, while Tanabata discloses the apparatus according to claim 3, Tanabata does not teach wherein the camera unit comprises cameras in sets of at least two so as to take a plurality of images and the storage means stores the calibration information for each camera.

Day discloses a system for automatically determining the position and attitude of an object (FIG. 3) wherein the camera unit comprises cameras in sets of at least two (FIG. 3, element 26) so as to take a plurality of images (Col. 6, lines 65 - 66) and the storage means (FIG. 3, element 42) stores the calibration information for each camera (Col. 8, lines 20 - 24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Tanabata to include the camera unit comprising cameras in sets of

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at least two so as to take a plurality of images as taught by Day "...for automatically determining the position and attitude of a three-dimensional body...", Day, Col. 3, lines 66 - 68 and the storage means storing the calibration information for each camera as taught by Day for the computer 40 to access the information from the mass storage 42 for calculation purposes.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578. The examiner can normally be reached Monday - Friday 8:30 - 17:00 ET.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner (SPE), Art Unit 2624